

GEORGETOWN HARBOR, INCLUDING SAMPIT RIVER AND
WINYAH BAY, SOUTH CAROLINA.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORTS OF
EXAMINATION AND SURVEY OF GEORGETOWN HARBOR, IN-
CLUDING SAMPIT RIVER AND WINYAH BAY, SOUTH CAROLINA.

JANUARY 13, 1904.—Referred to the Committee on Rivers and Harbors and ordered
to be printed, with illustration.

WAR DEPARTMENT,
Washington, January 11, 1904.

SIR: I have the honor to transmit herewith a letter from the Chief of Engineers, United States Army, dated January 8, 1904, together with copies of reports, with map, from Capt. J. C. Sanford, and Capt. G. P. Howell, Corps of Engineers, dated April 8 and September 26, 1903, of a preliminary examination and survey, respectively, of Georgetown Harbor, South Carolina, made by them in compliance with the provisions of the river and harbor act of June 13, 1902.

Very respectfully,

ELIHU ROOT,
Secretary of War.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, January 8, 1904.

SIR: I have the honor to submit herewith reports, dated April 8 and September 26, 1903, with map, by Capt. J. C. Sanford and Capt. G. P. Howell, Corps of Engineers, on preliminary examination and survey, respectively, of Georgetown Harbor, with a view of obtaining a channel with a navigable depth of 18 feet at mean low water, and a width of 400 feet, or such width as may be necessary or practicable, from a

point 1 mile above the limits of the city of Georgetown, in Sampit River, to the ocean entrance to Winyah Bay, South Carolina, as far seaward as may be necessary to form a project to secure said depth. These reports are made in compliance with a requirement in the river and harbor act of June 13, 1902, and attention is invited to the views thereon by Lieut. Col. James B. Quinn, Corps of Engineers, division engineer.

This locality is now under improvement by the United States, with a view to providing a depth of 15 feet at mean low tide by means of jetties and dredging, and in the opinion of the district and division engineers the further improvement proposed is worthy of being undertaken by the General Government. Captain Howell discusses in his report plans for improvement by way of two routes, designated as the eastern channel and the western channel, respectively, but he prefers the route via the eastern channel because less expensive, and he presents a detailed estimate of the cost of providing an 18-foot channel, 400 feet wide, by dredging and jetty construction; but the selection of the eastern channel for improvement is not approved by the division engineer, who recommends that the western channel be improved, and that training dikes be constructed as proposed by him.

These reports have been reviewed by the Board of Engineers for Rivers and Harbors, under the provisions of sections 3 and 14 of the above-mentioned act, and reports thereon are made in indorsements of July 7 and December 22, 1903. The existing project for improvement is summarized in the Board's report of July 7, and the Board recommends in its report of December 22 that this project be modified so as to provide for an 18-foot channel, as proposed by the act, at an estimated cost of \$650,000, inclusive of the balance of funds on hand, the improvement to be made by way of the western channel and to be accomplished by means of dredging and the construction of a training wall to deflect the current into the concave bend along the western shore.

I concur in the views of the Board.

Very respectfully, your obedient servant,

G. L. GILLESPIE,

Brig. Gen., Chief of Engineers, U. S. Army.

Hon. ELIHU ROOT,

Secretary of War.

PRELIMINARY EXAMINATION OF GEORGETOWN HARBOR, SOUTH CAROLINA, INCLUDING SAMPIT RIVER, AND THENCE TO AND INCLUDING THE OCEAN ENTRANCE TO WINYAH BAY.

UNITED STATES ENGINEER OFFICE,
Charleston, S. C., April 8, 1903.

GENERAL: I have the honor to submit the following report upon a preliminary examination of Georgetown Harbor, with a view of obtaining a channel with a navigable depth of 18 feet at mean low water and a width of 400 feet, or such width as may be necessary or practicable, from a point 1 mile above the limits of the city of Georgetown, in Sampit River, to the ocean entrance of Winyah Bay, South Carolina, as far seaward as may be necessary to form a project to secure said

depth, the examination being made in accordance with the requirements of the river and harbor act approved June 13, 1902:

The city of Georgetown is situated on Sampit River, less than a mile above its mouth, in Winyah Bay. The lower portion of the Sampit River has hitherto been known as Georgetown Harbor. The above-stated limits of this preliminary examination, however, include also nearly the entire length of Winyah Bay, as well as its ocean entrance, which is between North and South islands. As will be described hereafter, this entrance has recently been improved by two jetties springing from these two islands, respectively, and known as the north and the south jetty. The distance from Georgetown to the gorge of the entrance between the islands is about 12 miles, and to the outer end of the south jetty, which is the longer of the two, over 16 miles.

The Sampit River at Georgetown is somewhat over 400 feet wide, the channel being over 18 feet deep at mean low water along the upper half of the city front, and having a least depth of 15.9 feet along the lower half. Below Georgetown the river channel has a depth generally less than 18 feet, and just outside the mouth in Winyah Bay there was a particularly troublesome shoal on which the original depth was 9 feet (a narrow channel 12 feet deep has since been dredged through this shoal). Except for this shoal about 13 feet could be carried from Georgetown to the gorge at the mouth of the bay. The original depth across the ocean bar ranged from 7 to 9 feet.

Winyah Bay has an area of about 25 square miles. It receives the waters of Great Pedee, Waccamaw, and Sampit rivers. Due to the sediment brought down by the rivers it has large shoal areas. Over one-third of the length of the channel from Sampit River to the gorge has a depth of less than 18 feet, the ruling depth being about $12\frac{1}{2}$ feet except across the shoals just outside the mouth of the Sampit, where the depth is about 12 feet.

A project adopted in 1889 for the improvement of the ocean entrance to the bay provided for constructing two jetties, by which it was expected to secure a depth of 15 feet across the bar. By the river and harbor act of June 3, 1896, this project was placed under the continuing-contract system, its completion being authorized at a cost of not exceeding \$2,016,250, exclusive of amounts appropriated in former years, which aggregated \$428,750. To assist the action of the jetties, the seagoing suction dredge *Winyah Bay* was constructed in 1897-98, and has since been operated on the work, though not continuously. The jetties have been carried out to and beyond the originally projected length, but have not been given the full section originally thought necessary, as it had become evident that the required depth could be obtained by a less expensive section aided by the dredge.

The contract for constructing the jetties was terminated in November, 1902. The entrance channel has now the project depth of 15 feet, but is somewhat narrow in places. It is expected that the jetties, aided by dredging, will produce a depth of at least 18 feet.

As shown by the appended report of Assistant Engineer Reid Whitford, the commerce of Georgetown has greatly increased, due to the improvement of the ocean entrance. Enormous lumber mills have been built at Georgetown by the Atlantic Coast Lumber Company, the output of the mills being shipped north by steamships and sailing vessels. The following table of commercial statistics for the year

1901, is taken from the Annual Report Chief of Engineers for 1902, page 1156:

Articles.	Tons.	Value.
OUTWARD FREIGHTS.		
Naval stores	19,334	\$367,932
Cotton	3,525	564,000
Rice, rough and clean	9,360	580,467
Lumber, shingles, and cross-ties	171,094	1,090,507
Fish, game, and vegetables	1,900	190,000
Miscellaneous	1,243	1,665,000
Total	206,456	4,457,906
INWARD FREIGHTS.		
Miscellaneous	41,533	4,000,000
Grand total	247,989	8,457,906

The river and harbor act approved June 13, 1902, contained the following authorization:

Winyah Bay, South Carolina: The dredge or dredges employed in connection with the work of improvement of the entrance to Winyah Bay, and such other dredges owned or controlled by the Government as are used on Winyah Bay river systems and canals, may be used in dredging the shoal places between the entrance and the city of Georgetown, South Carolina, over which the least channel depths may at any time be less than at the entrance of the bay; and any expense so caused shall be paid from amounts appropriated or that may be appropriated for said Winyah Bay: *Provided*, That the expense of said dredging added to that of improving the entrance to said bay shall not exceed the total amount appropriated and authorized to be appropriated by act of June third, eighteen hundred and ninety-six.

The contract for jetty construction having now been terminated, it can be seen that, after deducting the estimated cost of protecting the shore end of the south jetty by works already approved, there will be available for dredging under the above authorization over \$400,000. This will, in my opinion, much more than suffice for obtaining an 18-foot channel, 400 feet wide, from Georgetown to the ocean. It is possible that the jetties may settle to a greater extent than expected, rendering it desirable for economical maintenance of the channel to expend a portion of this balance in raising them; but no estimate of the cost of this can now be made. In any event, I believe it will be possible with the above authorization to obtain an 18-foot depth with a width approximating 400 feet, and would not recommend entering at this time upon a new project.

Georgetown Harbor is, in my opinion, worthy of improvement at this time to the extent of securing an 18-foot depth by dredging under the above authorization of the act of June 13, 1902, with such width of channel, not exceeding about 400 feet, as the funds available will permit.

No survey is necessary, a survey of the bay in connection with work to be done under the above authorization having recently been made. The map of this survey is now nearly completed. From the results of the survey it can be determined whether the 18-foot channel should be dredged in the present eastern channel (described in Assistant Engineer Whitford's appended report) or in the western channel. The loca-

tion should, in my opinion, be chosen where the cost of securing and maintaining the channel will be the least.

Very respectfully, your obedient servant,

J. C. SANFORD,
Captain of Engineers.

Brig. Gen. G. L. GILLESPIE,
Chief of Engineers, U. S. A.
(Through the Division Engineer.)

[First indorsement.]

ENGINEER OFFICE, U. S. ARMY,
Norfolk, Va., April 17, 1903.

Respectfully submitted to the Chief of Engineers, United States Army.

Winyah Bay is scored with many channels, none of which appear to present any indications of permanency. If they could be combined in one and prevented from straying, there is no reason to doubt that a very satisfactory channel, of even greater depth than that desired, could be obtained. This result would involve the construction of brush dams at the head of Rabbit Island and at Frazier Point, so as to confine the water to the west channel, which, for the convenience of commerce, is the most desirable channel to improve, and, under the above conditions, would be the easiest to maintain.

I am doubtful about the feasibility of maintaining constantly an 18-foot channel, as proposed, by dredging, and I believe the object of the examination contemplates more than temporary expediency.

The cost of maintaining the jetties can not be stated, and yet the preservation of the jetties is of the first consequence in securing and maintaining an increased channel depth between them.

I do not approve of leaving the subject in a tentative shape, and believe the officer in charge of the improvement should be instructed to prepare an estimate which would promise definite results.

I concur with the district officer that the locality is worthy of improvement.

JAMES B. QUINN,
Lt. Col., Corps of Engineers,
Division Engineer, Southeast Division.

[Second indorsement.]

OFFICE CHIEF OF ENGINEERS, U. S. ARMY,
April 25, 1903.

Respectfully referred to the Board of Engineers for Rivers and Harbors constituted by Special Orders, No. 24, Headquarters, Corps of Engineers, series of 1902, for consideration and recommendation.

By command of Brig. Gen. Gillespie:

A. MACKENZIE,
Colonel, Corps of Engineers.

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., July 7, 1903.

Respectfully returned to the Chief of Engineers, United States Army.

The Board of Engineers for Rivers and Harbors has considered the within report of the district officer and the indorsement of the division

engineer thereon, in reference to the preliminary examination ordered by the river and harbor act of June 13, 1902, of—

Georgetown Harbor, with a view to obtaining a channel with a navigable depth of eighteen feet at mean low water, and a width of four hundred feet, or such width as may be necessary or practicable, from a point one mile above the limits of the city of Georgetown, in Sampit River, to the ocean entrance of Winyaw Bay, South Carolina, as far seaward as may be necessary to form a project to secure said depth.

On June 18, 1903, a committee of the Board inspected the locality and held a public hearing at which interested parties were given opportunity to express their views.

Georgetown, S. C., is situated upon Sampit River, less than a mile above its mouth, in Winyah Bay. From Georgetown to the gorge of Winyah Bay entrance is about 12 miles.

The project for the improvement of Winyah Bay contemplates a depth at the entrance of 15 feet at mean low tide, to be secured by means of jetties and dredging, and the river and harbor act approved June 13, 1902, authorized the use of available Government dredges in removing shoals between the sea entrance and Georgetown—

over which the least channel depths may at any time be less than at the entrance of the bay; * * * *Provided*, That the expense of said dredging added to that of improving the entrance to said bay shall not exceed the total amount appropriated and authorized to be appropriated by act of June third, eighteen hundred and ninety-six.

At the sea entrance there is now the projected depth of 15 feet, and it is expected that the jetties, aided by dredging, will produce a depth of at least 18 feet. More than one-third of the distance between Georgetown and the jetties has a depth of less than 18 feet, the controlling depth being about 12 feet.

It is the opinion of the district officer that the balance from amounts heretofore appropriated or authorized will suffice to produce a channel 400 feet wide and 18 feet deep from Georgetown to the sea.

The commerce of Georgetown is large and increasing, being reported as 247,989 tons, valued at \$8,457,906, in 1901. The Winyah Bay system of navigable streams embraces nearly 800 miles of waterways, and affords cheap transportation routes from interior points throughout much of the eastern portion of South Carolina to the seaboard at Georgetown.

The Board is of opinion that it is advisable formally to modify the project for the improvement of Winyah Bay so as to provide for an 18-foot channel, and recommends that the district officer be directed to prepare a project and estimate of cost of an 18-foot channel 400 feet wide in the bay, and of suitable width in Sampit River, from a point 1 mile above the limits of the city of Georgetown to the ocean entrance of Winyah Bay, South Carolina, as far seaward as may be necessary to secure said depth.

For the Board:

CHAS. J. ALLEN,
Lieut. Col., Corps of Engineers,
Senior Member of the Board.

[Fourth indorsement.]

OFFICE CHIEF OF ENGINEERS, U. S. ARMY,
July 11, 1903.

Respectfully submitted to the Secretary of War.

This is a report on preliminary examination of Georgetown Harbor, South Carolina, authorized by the river and harbor act approved June 13, 1902.

Inviting attention to the report of the Board of Engineers for Rivers

and Harbors, in the preceding indorsement, I recommend that the local officer be directed to prepare the project and estimate of cost recommended by the Board.

A. MACKENZIE,
Acting Chief of Engineers.

[Fifth indorsement.]

WAR DEPARTMENT,
July 14, 1903.

Approved as recommended by the Acting Chief of Engineers.

WM. CARY SANGER,
Acting Secretary of War.

[Sixth indorsement.]

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, October 7, 1903.

Respectfully returned to the Board of Engineers for Rivers and Harbors, with project and estimate, as recommended, attention being invited to the fact that the balance of present contract authorization would not be applicable to the new project, except in the item of dredging, as permitted by the river and harbor act of 1902, without special action by Congress, and, further, that this balance may be materially reduced before such action will be taken should Congress give the matter favorable consideration.

By command of Brig. Gen. Gillespie:

H. F. HODGES,
Major, Corps of Engineers.

[Seventh indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., December 22, 1903.

Respectfully returned to the Chief of Engineers, United States Army.

The Board of Engineers for Rivers and Harbors has considered the accompanying report on a survey with a view to a project and estimate for a channel 18 feet deep from a point on the Sampit River 1 mile above the limits of the city of Georgetown, S. C., to the ocean entrance of Winyah Bay of suitable width in the river and 400 feet wide elsewhere.

The district officer estimates the cost of dredging such a channel, following the western shore of Winyah Bay, at \$520,000. For a part of this channel he recommends a less expensive location near the axis of the bay. Navigators prefer the western route, the division engineer advocates it, and the Board believes that its greater cost is more than offset by its superior advantages. In addition to the estimate for dredging there are submitted estimates of \$130,000 for a training wall, to deflect the current into the concave bend along the western shore, and of \$325,000 for building up the Winyah Bay jetties. The last item of work would be no more necessary in connection with the 18-foot project now contemplated than as a part of the existing project. It is believed by the Board that the raising of the jetties is not immediately necessary, and need not now be provided for.

The Board renews its recommendation, as expressed in third indorsement hereon, that the project for the improvement of Winyah Bay be modified so as to provide for an 18-foot channel from a point 1

mile above the limits of the city of Georgetown, in Sampit River, to the ocean entrance of Winyah Bay, South Carolina, as far seaward as may be necessary to form a project to secure said depth, in accordance with the project above described, at an estimated cost of \$650,000, inclusive of the balance on hand.

For the board:

A. M. MILLER,
Lieut. Col., Corps of Engineers,
Senior Member Present.

REPORT OF MR. REID WHITFORD, ASSISTANT ENGINEER.

UNITED STATES ENGINEER OFFICE,
Georgetown, S. C., August 18, 1902.

CAPTAIN: In compliance with instructions contained in your letter of July 31, 1902, I have the honor to make the following report on the preliminary examination of Georgetown Harbor, South Carolina, as provided for in the river and harbor act of June 13, 1902, which specified that the examination was to be made "with a view of obtaining a channel with a navigable depth of 18 feet at mean low water, and a width of 400 feet, or such width as may be necessary or practicable, from a point 1 mile above the limits of the city of Georgetown, in Sampit River, to the ocean entrance of Winyah Bay, South Carolina, as far seaward as may be necessary to form a project to secure said depth."

This, therefore, embraces practically all of Winyah Bay, from its sea entrance, and a portion of the Sampit River to a point above the wharves of the city of Georgetown, a distance of probably 18 miles.

Winyah Bay is a catch-basin, so to speak, for large volumes of fresh water brought down by many miles of tributary rivers, and as this water carries sand and silt in varying quantities, shoals are liable to be formed in the bay from deposits of these materials. When these up-country rivers are in freshet Winyah Bay is entirely fresh at low water.

The Sampit River, on which Georgetown is situated and less than a mile from its mouth, is nothing more than a tide-water arm of Winyah Bay and reaches a comparatively short distance in the direction of the Santee River. The worst place for navigation on the Sampit, in the vicinity of Georgetown, is immediately at its mouth where it joins Winyah Bay. Here there was originally a shoal, somewhat less than a half mile in length, on which there was a controlling depth of about 10 feet at mean low water.

Under a survey and appropriation made by the United States Government, between the years, approximately, 1882 and 1886, dredging operations were carried on here to a depth of 12 feet and width of 200 feet at mean low water. As funds were not provided to maintain the dredged channel it has probably filled to a certain extent. Further than this, no attempt has been made by the General Government to deepen the shoals in Georgetown Harbor, of which there are three others, two being in the eastern channel, between beacons 1, 3, and 5, and one in the western channel, between Mosquito Creek and beacon No. 5, except that under authority granted by a previous river and harbor act the suction dredge belonging to Winyah Bay did a little dredging on shoal at beacon No. 1. This did not amount to much, as it was only allowable for the dredge to work on the shoals in the upper bay when the weather was too rough for dredging at the sea entrance.

The jetties which are in course of construction at the sea entrance to Georgetown Harbor, under a project to provide 15 feet depth at mean low water there, are nearing completion. The depth reported by the survey in June last was 13.9 feet at mean low water. The jetties under the present contract are being built only to partial dimensions, and it may in time be necessary, in order to maintain an 18-foot mean low-water channel at the sea entrance to the harbor, to increase the widths and heights of the jetties, requiring considerable quantities of stone to do so.

The depths now on the upper shoals are approximately as follows at mean low water: Mouth of Sampit River, 13 feet; between beacons Nos. 3 and 5, eastern channel, 12.6 feet; between beacons Nos. 1 and 3, 12.5 feet; average depth in the western channel, 10.6 feet.

These depths are said to be sufficient to fill the present demands of commerce in Georgetown Harbor. The delay caused the ships by the existence of these shoals obstructs the rapid development and expansion of the commerce of the port. As the ships leave Georgetown on low water to meet the rising tide on the outer sea bar, it

is evident that the depth in the upper harbor is insufficient, and, as a matter of fact, everyone agrees that 15 feet at mean low water, under which the present project is carried on, is not depth enough to accommodate the large steamships plying in and out of the port. So far as is known, this is the first examination which has ever been made over the area designated above by the United States Government looking to the removal of the shoals of the upper harbor simultaneously with the deepening of the sea bar at the entrance.

COMMERCE.

Mr. John I. Hazard, a prominent business man of this place, for the fiscal year ending June 30, 1886, reported the value of the commerce of Georgetown Harbor to have been \$3,757,273.05, which was carried on by about 30 sea-going vessels of about 300 tons (average) each. There were also reported 7 steamers engaged in traffic, some of them on the rivers tributary to Winyah Bay, and the others engaged on the route between Charleston and Georgetown. Mr. Hazard said at the time that he had used considerable care in collecting the foregoing figures, so that they might be as reliable as possible.

The present yearly commerce of Georgetown Harbor is said to be about 247,989 tons, valued at \$8,457,906, and is carried on by the list of vessels hereto attached. These commercial figures were furnished by Mr. W. D. Morgan, mayor of Georgetown, who consumed months in collecting them from various sources, including shippers, freight offices, and the like. Mr. Morgan has had long and special experience in this character of work, in keeping an account and watching carefully the commercial development of Georgetown, and his statement is believed to be as correct as it is possible to obtain it unless a daily record was made of all the shipments in and out of the port, including freights carried on pull boats, small sailing vessels, and craft of like description, of which no account is kept by anyone.

From my own personal knowledge of the value of the Georgetown Harbor commerce at present, it is conscientiously believed that Mr. Morgan has not overestimated the figures given above, but that if anything it is undervalued. It shows an increase of about 25 per cent over the preceding year. This need not create any surprise when it is remembered that the United States, by the improvement of the outer sea entrance, has deepened the water there. Together with this impetus which has been given to shipping, the Atlantic Coast Lumber Company—a huge affair of the kind—established a milling plant in Georgetown, said to be second to none, not only in the United States, but in the world. The shipments from this plant necessarily increase the commerce of the port. Aside from this, the general prosperous condition of the country which has existed for the past several years has greatly increased the shipment of freights in Georgetown Harbor from its many miles of tributary rivers.

PROSPECTIVE COMMERCE.

As to the prospective commerce, this can only be a matter of estimate, based on the knowledge of the resources of the country, which may be drawn from by Georgetown Harbor, as well as the expansion of commercial plans proposed by the business men of this community.

It would scarcely be fair to say that anyone could foresee that the commerce would be less than that stated above; it is scarcely probable that it would remain stationary; therefore, the natural conclusion is that it would increase in proportion as ships could carry larger loads on deeper draft, thereby lessening the freight rates.

Georgetown Harbor possesses the peculiar advantage of not being forced to depend upon railroads for the supply of her port's commerce, because it is tributary to about 800 miles of navigable rivers, reaching to many parts of the State. These highways, free to all, will of necessity always furnish Georgetown Harbor with no inconsiderable amount of trade. This will be proportionate to the free and safe navigation provided on the rivers by the General Government.

As the value of the commerce apparently more than doubled between the years 1886 and 1902, a period of sixteen years, largely brought about, no doubt, by the improvements made in the harbor and rivers in the State by the Government, it is but fair to assume that, with continued improvement on the rivers and deeper water furnished in the harbor, with the continued prosperous wave over the country, it ought to increase under these conditions more rapidly in the future than it has in the past. It is said now that the value of the commerce to-day is at least \$600,000 more than that reported above.

NATURAL FEATURES.

After leaving the mouth of Sampit River, which is a part of Georgetown Harbor, and proceeding down Winyah Bay seaward, there are two channels which fork, oppo-

site Frazier Point, about at beacon No. 5—one running around the curved western shore of Winyah Bay and known as the western channel, while the other cuts across, forming a broken line of a chord, so to speak, of the arc of the curve of the western side. This other is known as the eastern channel.

Thirty years or more ago, so it is said, the western channel was in use and not the eastern, but some time after that the western side was abandoned and the eastern channel adopted, and which has been in use ever since. Why one was rejected for the other is not known, except that perhaps the western side showed a disposition to shoal.

All shipmasters and pilots claim now that it would be much preferable to improve the western side for navigation. They give as their opinion, and not without good reason, too, that ships could pass through the western channel during nights and thick weather when it would be impossible to make the trip on the eastern side. They say that the western channel being near the land, the shore line would be visible as a guide, and, further, that the thread of the current being parallel with the lines of this channel, they would be enabled to steer straight courses and thus avoid dangerous side drifts.

By comparison the eastern channel possesses none of these advantages, it being much farther removed from the shore line and contains cross currents.

At present the depth of water in the eastern channel is greater than that in the western. This has probably been caused by the use of the western being abandoned by the deeper draft vessels.

As far back as the year 1800, when there was probably very little, if any, navigation in either, a chart of that date shows the depth in both to be about the same.

The opinions of different persons interested in the navigation in Georgetown Harbor being so positive in favor of the improvement of the western channel, they were requested to put what they had to say on the subject in writing, which will be forwarded to you for information with this report.

In regard to this matter, the opinion of the undersigned is that the western channel would undoubtedly be easier of navigation in all kinds of weather than the eastern. The first cost of dredging the western one would be greater than the eastern, but it might be worth more to the shipping of the port. After once improved, it would probably not cost more for maintenance than the one on the eastern side. Though the distance is somewhat greater on the curved side than on the eastern side, still there would be only a few minutes difference to boats going by either route. As to cross currents in one and straight in the other, this can not be stated as a fact unless so proved by observations. It does seem, however, that the western channel lies more nearly in the direction of the natural flow than the eastern one.

Very respectfully, your obedient servant,

REID WHITFORD,
Assistant Engineer.

Capt. J. C. SANFORD,
Corps of Engineers, U. S. A.

LETTER OF PILOT COMMISSIONERS OF GEORGETOWN, S. C.

GEORGETOWN, S. C.

DEAR SIR: If any dredging is to be done in Winyah Bay, under the new river and harbor act, we the undersigned pilot commissioners of Georgetown, S. C., would like to recommend that it be done in what is known as the western channel, because it is straighter, easier for navigation, and plainer on account of the woods and banks being nearer, and the natural slope of the current is also with this channel, while in the eastern channel there are cross currents to be encountered.

Prior to 1865 the western channel was used exclusively. From the best information we can get now, the depth is 11 feet, and it has been gradually deepening since its increased usage on account of commerce coming through the Estherville Canal.

J. B. STEELE.
CHAS. S. CONGDON.
LOUIS S. EHRICH.
G. H. WATTS.
A. A. SPRINGS.
D. L. ELLIS.

Mr. REID WHITFORD,
United States Assistant Engineer.

LETTER OF PILOTS OF GEORGETOWN HARBOR, SOUTH CAROLINA.

JULY 25, 1902.

We, the undersigned pilots of Georgetown Harbor, hearing that the Government is about to make some improvements in the way of deepening the channel in Winyah Bay between Georgetown and the sea bar, would respectfully suggest that the improvement be made in the westward channel in place of in the eastward one, for several reasons: (1) Because the westward channel affords, by the woods along the shore, a guide for boats passing in thick weather; (2) that the bottom of this part of the bay being mud, can be more easily dredged, and as the natural flow of the water in the bay is on this side it may be kept deep much easier.

This channel can undoubtedly be used by ships in such weather as is impossible to use the eastward one. There are also cross currents in the eastward channel which are not in the westward one, and, altogether, we think that the westward channel would be better for shipping.

Very respectfully,

Capt. G. H. WATTS, *Pilot.*

Capt. THOS. P. FRASER, *Pilot.*

D. R. NESMITH, *Pilot.*

A. A. WILSON, *Pilot.*

ANTONIA A. SMITH, *Pilot.*

MR. REID WHITFORD,
United States Assistant Engineer.

LETTER OF ATLANTIC COAST LUMBER COMPANY.

GEORGETOWN, S. C., August 1, 1902.

DEAR SIR: In accordance with conversation the writer had with Captain Springs and your Mr. James in regard to which channel is preferable:

We have talked over same with both Captain Thorson, of the steamship *Georgetown* and Captain Blake, of the steamship *Aragon*, and they both hold the same opinion that we do, viz, that it would be much better to dredge out the southern channel—meaning the one that was used years ago—on account of its being freer from cross currents and not so liable to change as the one now being used.

We expected also to take this up with Captain Fickett, of the *Waccamaw*, but have not been able to see him up to the present writing, and as your clerk stated you wished the map, will not hold it any longer. We will ask Captain Fickett to call at your office and give you his idea in regard to this matter.

Yours, very truly,

ATLANTIC COAST LUMBER CO.,
By RAYMOND S. FARR,
Assistant General Manager.

MR. REID WHITFORD,
United States Assistant Engineer.

LETTER OF CAPT. A. C. FICKETT.

GEORGETOWN, S. C., August 2, 1902.

DEAR SIR: In accordance with your request for an opinion regarding the practicability of the two channels in Winyah Bay, would advise using the western channel as being far better in every way; being more convenient for ships going up and down, as it follows the natural trend of the current, making it easier to keep up and giving a shore line to follow in the night or thick weather.

Very truly, yours,

A. C. FICKETT,
Master Steamship Waccamaw.

MR. REID WHITFORD,
United States Assistant Engineer.

List of vessels at and entering the port of Georgetown, S. C., during the calendar year 1901.

Name.	Character.	Length.	Breadth.	Depth.	Gross tons.
		<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	
Waccamaw	Screw steamship	256	42	14	1,359
Georgetown	do	256	42	14	1,359
Saginaw	do	238	34.3	17.1	1,835
Richmond	do	206	33	21.6	1,437
Oneida	do	205.8	29.9	18.6	1,322
Geo. W. Clyde	do	256	35	19.2	1,848
Wm. P. Congdon	Screw steamer	75.2	18.2	7.8	68
S. S. Brewster	do	77.5	18.5	7.6	50
Martha Helen	do	82	16.7	7.4	75
Bon-Accord	do	67.3	14.4	5	42
Henry Lloyd	do	40.5	12.2	4.8	13
Fearless	do	58	11	4	18
Emma A. Twiggs	do	53	13.2	4.5	16
Pender	do	52.7	14.9	3.4	28
Bertie	do	49.5	9.8	3.5	16
E. T. Williams	do	81	21	9	97
Robert E. Lee	do	67	17	4.5	56
Two Brothers	Stern-wheel steamer	75.1	30.1	5.4	97
Louisa	do	101	25	5	280
Frank Sessoms	do	86.6	22.8	3.6	79
Merchant	Side-wheel steamer	147.7	29.6	5.4	405
Governor Safford	do	129.6	26	7.5	307
Ruth	do	81	26	4	89
F. G. Burroughs	do	125	22	6	283
John M. Cole	do	130	39.6	5	318
Wm. Elliott	do	101	31	6	171
Eutaw	do	156	29.8	7.8	547
Planter	do	155	32.8	9.1	499
Winyah	Schooner	43.2	16.4	6.1	18
Blanche Creamer	do	46.1	14.4	4	15
We Go	do	44	13.7	4.3	18
Hugh	do	47.6	14.2	3.4	14
Waccamaw	do	137.7	33.3	14.5	458
E. A. Danenhower	do	116.6	30.2	8.7	228
Nellie Floyd	do	136	33	15.4	457
Bayard Hopkins	do	118	30	9	269
Wm. Linthicum	do	112	27.6	8	156
Robert McClintock	do	96	26.7	7.4	154
Warren B. Potter	do	130	32.4	12	368
Chas. H. Sprague	do	122	30.7	9.5	318
Willie L. Maxwell	do	131.6	32.7	9.5	315
Puritan	do	85.5	28.7	7.3	116
Myra W. Spear	do	99.2	27.6	7.5	156
Geo. R. Congdon	do	133	32.4	14.8	458
Edward L. Martin	do	87.2	23.6	6.8	84
Rebecca R. Douglass	do	138.8	33.9	9.5	475
Percy & Lillie	do	141	33.5	14.1	503
Golden Ball	do	124.2	30.3	10.5	286
Chas. Linthicum	do	104	26.4	8.2	131
J. A. Beckman	do	140.7	34.2	16.1	485
Edward W. Young	do	149.5	34.4	12.3	424
Venus	do	108	29.4	9.1	204
Fannie Reiche	do	143.1	34	10.1	463
Sarah D. J. Rawson	do	140.5	34.8	11.1	387
John T. Russell	do	66.2	22.2	4.7	36
William Churchill	do	143.6	34.7	11	432
Abbie C. Stubbs	do	130	32.2	12	345
Etta	Sloop	47	11	3.3	8
Clipper	do	31	11	2.9	10
Leila	do	31	10	2.5	8
Liza Jane	do	40.8	12.5	4.9	17
Socastee	Barge	47	12	4	16
Enterprise	do	41.5	12	3.5	17
Willie	Yacht	40	9	4	a 6
Madge	do	35	7	2	a 3
Sprite	do	37	8	3	a 5
Leilah	do	40	8	3	a 5
Thistle	do	43.6	11.5	3.9	a 13
Almont	do	40	8	5	4
Pelican	Naphtha launch	30	7	2.5	3
Wapella	do	30	7	2.5	3
Maria C	Yacht	35	10	4.5	8
Petrel	do	40	10	3.5	9
Advance	do	25	5.5	1.5	a 2
Loretta	do	40	9	3	a 7
Husted	do	42	8	3	a 5
Sym	do	36	7	3	a 3

^a Approximate.

SURVEY OF GEORGETOWN HARBOR, SOUTH CAROLINA, INCLUDING SAMPIT RIVER, AND THENCE TO AND INCLUDING THE OCEAN ENTRANCE TO WINYAH BAY.

UNITED STATES ENGINEER OFFICE,
Charleston, S. C., September 26, 1903.

GENERAL: I have the honor to submit herewith report, in duplicate, with map, of a survey of Winyah Bay, made by Assistant Engineer Reid Whitford for the purpose of ascertaining the cost of an 18-foot channel at mean low water from the ocean entrance to a point 1 mile above the city of Georgetown, S. C., on the Sampit River.

Dredging at the entrance between the jetties to increase the depth from 15 feet to 18 feet will cost about \$96,500. Dredging in Sampit River will cost about \$113,500. Between these two places lies Winyah Bay. The present channel in the bay where dredging will be required is called the eastern channel. Its length is 22,830 feet, and its shoalest place is 13 feet. To dredge contemplated channel will cost about \$166,000. The western channel, which was used at some previous time, is 25,700 feet long, and its shoalest place is 9½ feet. To dredge it will cost \$310,000, an increase of \$144,000 over the eastern channel.

The western channel is favored by masters of vessels and pilots because it follows the land, has no cross currents, and could be easily navigated in fogs. The eastern channel is far from land and has cross currents, caused by the water's flowing into Mud Bay. In foggy weather, when the range lights could not be seen, there would be no shore line to act as guide, and the cross currents might throw the vessel out of the channel. Although the current observations show that at ebb tide the bulk of the current flows around Frazier Point into the eastern channel it would seem from the map that it should follow the western channel, and is attracted toward the eastern channel on account of the deeper water there. Undoubtedly the best and safest channel for navigation purposes can be obtained by dredging the western.

But the matter of cost has to be considered. It has been shown that the item of dredging is \$144,000 more. The training wall will probably be required to throw the current in its direction in order to maintain the channel. Mr. Whitford proposes to build it with mattress foundation and stone on top, and estimates its cost at \$148,808. Its construction is costly, as it will have to cross the deep water (21 feet) leading to the eastern channel; and although the mattress might be omitted the cost will still be about \$130,000. It is not believed that the training wall from Frazier Point to Marsh Islands will be required. No work has been done on the eastern channel, but it has maintained itself well. After it is dredged to 18 feet the increased flow of water will maintain the depth.

It remains to be considered whether the interests of navigation justify the expenditure of \$274,000 in order that vessels may use the western channel in time of fog, when the ranges can not be followed. As fogs are not frequent on this coast the resulting delay in using the eastern channel will not be serious. I am of the opinion that the eastern channel should be selected, even though it be decided to build the training wall across Mud Bay to prevent deflecting currents. Its cost would be \$40,000, omitting the mattress foundation, and the saving would still be \$234,000.

In the construction of the jetties at the entrance to the bay, in order to get immediate effect upon the channel, the jetties were carried out to the full length and height with only a narrow crest. The top has been knocked down by the waves to the level of low water and below for a long distance, and it becomes necessary to raise the jetties to the contemplated height of 6 feet above mean low water to get the full benefit of the scour. This is especially necessary, since it is desired to increase the present depth by 3 feet. The mean rise and fall of tide is $3\frac{1}{2}$ feet. To build the jetties throughout their full length to their proper dimensions will cost about \$325,000.

Out of the original estimate of \$2,500,000 for completing the jetties, to provide 15 feet at mean low water, there remains on September 1, 1903, an approximate balance of \$406,000. The cost of providing the 18-foot channel, 400 feet wide, as recommended by me, is as follows:

Dredging:	
Entrance to Winyah Bay	\$96,500
Eastern channel	166,000
Sampit River	113,500
Total	376,000
Rebuilding jetties	325,000
	701,000
Less balance from the present 15-foot project	406,000
Total	295,000

I believe that the improvement of the channel leading to Georgetown, S. C., to the extent indicated, is justified by the commercial interests involved.

The rivers that empty into Winyah Bay are under improvement by the General Government. Congress has recently authorized an expenditure of about \$120,000 on the Great Pedee River to allow the products from its upper portion to be brought to tide water. The Waccamaw River is now being surveyed with a view to revising its project for improvement. The canal connecting the Santee River and Winyah Bay is being deepened. The completion of these improvements will naturally add to the commercial importance of Georgetown and cause its business to increase.

The commercial statistics show an increase of 1902 over 1901 of 139,482 tons, a gain of over 50 per cent; of 1902 over 1900, 257,832 tons, a gain of almost 200 per cent. The figures for the past three years are as follows:

Year.	Tons.	Value.
1900	129,639	\$6,749,433
1901	247,989	8,457,906
1902	387,471	9,310,682

The great increase is in lumber. The figures are as follows:

Year.	Tons.	Value.
1900	63,400	\$409,638
1901	171,094	1,090,507
1902	317,339	2,145,241

This is owing to the establishment at Georgetown of the Atlantic Coast Lumber Company, said to be the most extensive plant of the kind in the world. The company operates several large steamships. The report of Assistant Engineer Reid Whitford is inclosed. He has considered fully what may be required to secure and maintain the channel, and has given the cost of every item.

Very respectfully,

G. P. HOWELL,
Captain, Corps of Engineers.

Brig. Gen. G. L. GILLESPIE,
Chief of Engineers, U. S. A.
(Through the Division Engineer.)

[First indorsement.]

OFFICE DIVISION ENGINEER, SOUTHEAST DIVISION,
Savannah, Ga., October 2, 1903.

Respectfully submitted to the Chief of Engineers.

The western channel seems to be preferred by all those interested in the improvement. With a proper arrangement of training walls it is capable of being rendered far more stable than the eastern channel, with its uncertain cross currents and exposed locations.

It is even possible, with properly arranged training dikes, so as to direct the ebb and flood currents, that the western channel might be deepened by natural scour to the required depth. A dike, for example, constructed on the line between the second "R" in "Frazier" and the "W" in "western," beginning where this line intersects the "proposed stone training wall" and ending at the 12-foot contour of depth near "W," would direct a large volume of water into the western channel during ebb tide, and another on the line between the letters "A" in "eastern channel" and "western channel" (in the word "channel"), respectively, extending from near the 4.9-foot sounding near the eastern channel to the 6-foot sounding near the western channel, would concentrate a large volume of the flood current into the western channel. The combined lengths of these two dikes would be less than that of the "proposed stone training wall" and need not cost as much, and certainly not much more than the "proposed stone training wall for eastern channel." If built in advance of any dredging, their influence might be sufficient to obviate the necessity for any dredging in the western channel.

The difference in the cost between the two channels, as estimated, becomes a matter of minor consideration when the wish of those interested in the improvement is to be regarded and the unquestioned advantages of navigation and permanency of channel are involved.

I do not approve of the selection of the eastern channel for improvement or of the location for the stone training walls as proposed, but recommend that the western channel be improved, and that training dikes be located as explained above.

JAMES B. QUINN,
Lieut. Col., Corps of Engineers,
Division Engineer, Southeast Division.

REPORT OF MR. REID WHITFORD, ASSISTANT ENGINEER.

UNITED STATES ENGINEER OFFICE,
Georgetown, S. C., August 11, 1903.

CAPTAIN: In compliance with instructions contained in your letter of July 21, 1903, I have the honor to send by this mail tracing of the survey from the ocean entrance of Winyah Bay to a point about a mile above the city of Georgetown, made for the purpose of ascertaining the estimated cost of deepening the channels to 18 feet depth and 400 feet width at mean low water between these points.

It is thought that considerable more dredging than 400 feet in width will have to be done to actually provide and maintain a 400-foot channel at the jetties, and 25 per cent has been added to the cubic yards found to be contained in the south-jetty and middle-ground channels. The cubical contents were determined by getting an average cutting from the soundings inclosed between lines, 400 feet apart, on map of June 30, 1903, for 18 feet depth at mean low water, being the latest survey of these channels.

Total length of both channels to be dredged (south jetty and middle ground) 14,800 feet.

Estimate.

	Cubic yards.	
South-jetty channel	234, 074	
Middle-ground channel	349, 536	
Material, sand, mud, and shells	583, 610, at 15 cents..	\$87, 541. 50
Add 10 per cent for contingencies		8, 754. 15
Total		96, 295. 65

It may be in order that to hold this depth the superstructure of stonework on both the north and south jetties will have to be built up to their originally intended height, which is about 6 feet above mean low water.

The following estimate of stonework is therefore suggested as an item to be included in the general amount for future possible work at the ocean entrance:

Estimate.

	Tons stone.	
North jetty	42, 250	
South jetty	76, 200	
Stone work, in place	118, 450, at \$2.50..	\$296, 125. 00
Add 10 per cent for contingencies		29, 612. 50
Total		325, 737. 50

This estimate was determined as follows, and can only be considered as approximate, as figures of more accuracy can only be furnished after more careful cross section of stone work of existing jetties, time not being allowed for this detailed investigation. One hundred pounds per cubic foot was taken as weight of stone. The outer end of jetties cross sectioned every 500 feet, and an assumed cross section plotted on existing stone work, 40 feet base, 20 feet width of crest, and 6 feet in height above mean low water. The areas of these cross sections were all determined by a planimeter, and an average one secured for multiplication by the length of the jetty in question.

The inner shore ends of the jetties, where the water is wasting through and over them considerably on the ebb tide, were estimated to require 150 tons stone for each 100 linear feet, or $1\frac{1}{2}$ tons to the foot, to build them up to height of 6 feet above mean low water.

It is not certain that the foregoing expenditure for stone work is necessary to secure and maintain the 18-foot depth at mean low water, though it may be. Therefore this provision is made in the general estimate.

One-half of the above estimate for stone work might properly be charged to maintenance of old stone work.

After leaving the entrance, coming up, near Mosquito Creek, the channel forks, one being known as the eastern channel and the other as the western channel. They become one channel again farther up, all of which is shown on accompanying tracing.

The eastern channel is now in use and has been for a number years, but the western channel was the one originally navigated. Just exactly what year and for what reason the western channel was abandoned for the eastern is not known by the undersigned.

All seafaring men and others interested in the actual running of boats on Winyah Bay say the western route is greatly preferable to the eastern, and that though the eastern route may be improved, still there will be cross currents in it which will prohibit the running of their ships in dark and foggy weather there, but that the western side, where the land can be tracked around, so to speak, and the currents kept head-to to the ships, will give very little trouble from these causes.

The written opinions on this subject of a number of masters of vessels and pilots were forwarded to your office with preliminary examination report of Georgetown Harbor, dated August 18, 1902, and all express themselves in favor of the western channel being improved.

In the opinion of the undersigned, though the improvement of the western channel will cost more, it will be much more beneficial for the future development of the port, not only for reasons given, but also because the Estherville-Minim Creek Canal, connecting Santee River with Winyah Bay, has one of its terminals in the western channel, and all boats to and from the Wateree, Congaree, and Santee rivers will of necessity have to use this channel, and sooner or later no doubt it will be essential to deepen it regardless of the eastern route.

Estimate for the western channel.

[400 feet width, 18 feet depth at mean low water, length 25,700 feet.]

Cubic yards, sand and mud, 1,875,822, at 15 cents.....	\$281, 373. 30
Add 10 per cent for contingencies.....	28, 137. 33
	<hr/> 309, 510. 63

Estimate for the eastern channel.

[400 feet width, 18 feet depth at mean low water, length 22,830 feet.]

Cubic yards, sand and mud, 1,008,428, at 15 cents.....	\$151, 264. 20
Add 10 per cent for contingencies.....	15, 126. 42
	<hr/> 166, 390. 62

It will be observed that this makes the dredging in western channel cost \$143,120.01 more than in the eastern, but if the eastern channel can not be used after its improvement except in fair weather it is thought that the western should be given preference, even though the first cost seems to be more.

Some current observations were made at Frazier Point to determine the general directions of the ebb flow, the result of these being shown on accompanying tracing.

Time was not allowed to make these observations as thorough as they might be, but sufficient information was gained to indicate that the greater bulk of the ebb current forks at Frazier Point and follows the deeper water in the eastern channel, evidently being attracted in that direction by the less obstructed passageway of this course, as well as being drawn toward the large area of Mud Bay.

It is believed that once the western channel is deepened the current will naturally go in that direction, but as an aid to nature to deflect the water to the western it may be necessary to provide for a training wall of stone and mattress foundation to spring from Frazier Point and run in the direction as shown on tracing.

It would be proposed to build it of mattress foundation, of fascines and grillage poles, laid on the bottom, 30 feet wide, to receive stone filling to weigh from 10 to 300 pounds, with its crest about 5 feet wide and about 2 feet above mean low water. This would contain an area of stone in cross section averaging about 204 square feet, length of training wall to be about 5,700 linear feet.

Therefore the following estimate of its approximate cost is made, 100 pounds again being taken as the weight of 1 cubic foot of such stone:

Mattress foundation, 19,000 square yards, at \$1.....	\$19, 000
Stone filling, 58,140 tons, at \$2.....	116, 280
	<hr/> 135, 280
Add 10 per cent for contingencies.....	13, 528
	<hr/> 148, 808

It is by no means certain that this training wall will be required to turn the current in the western channel, though it may be; therefore, provision is made in the general estimate.

If the eastern channel should be adopted, there would probably be required a training wall reaching across the mouth of Mud Bay from Frasier Point to Marsh Islands, for the purpose of maintaining the depth dredged and in deflecting the current straight down this channel, and to be constructed in general as the training wall for the western channel.

This would contain an area of stone in cross section averaging about 74.75 square feet, length of training wall to be 8,500 feet, the following estimate of approximate cost being made:

Matress foundation, 28,333 square yards, at \$1	\$28,333
Stone filling, 31,768.5 tons, at \$2	63,537
	91,870
Add 10 per cent for contingencies	9,187
	101,057

Estimate.

[For shoal at and above mouth of Sampit River, at Georgetown, width to be 400 feet, depth 18 feet at mean low water, length 11,200 feet.]

460,284 cubic yards sand and mud, at 15 cents	\$69,042.60
85,671 cubic yards hardpan, at 40 cents	34,268.40
	103,311.00
Add 10 per cent for contingencies	10,331.10
	113,642.10

RECAPITULATION.

General estimate:

North and south jetty channels, dredging	\$96,295.65
Stone work, rebuilding north and south jetties	325,737.50
Western channel, dredging	309,510.63
Western channel, stone training wall	148,808.00
Dredging shoal at Georgetown	113,642.10

Grand total 993,993.88

Of the above, for works of improvement, \$831,125.13; maintenance, \$162,868.75.

Were the eastern route substituted for the western the total amount of this estimate would be \$803,122.87, the difference being caused by less cost of training wall and dredging, for each item, as above shown.

The original estimate of the Board of Engineers, January 17, 1889, for completing the north and south jetties in a manner to provide 15 feet depth at mean low water was \$2,500,000.

Approximate amount which has been expended in obtaining this depth under present existing project, so far as known to this office, about \$2,000,000.

Approximate balance of original estimate left unexpended, \$500,000.

Approximate aggregate estimate required to provide a channel 18 feet depth at mean low water, about 400 feet wide, from ocean entrance of Winyah Bay to a point about 1 mile above city of Georgetown, through the shoals in the jetty channels and the upper bay, \$993,993.88.

Amount required for covering distance as stated, in excess of amount originally estimated for providing only 15 feet at mean low water, which was confined strictly to the jetty channels, \$493,993.88.

The estimates for dredging eastern, western, and Georgetown shoals were made by plotting these shoals on a scale of 200 feet to the inch for the eastern and western channels and 100 feet to the inch for shoal at Georgetown, the cubical contents being determined in a similar manner to that used for south-jetty and middle-ground channels.

The current directions were obtained by perforating and telescoping two galvanized-iron buckets, the bottom of one being down and the bottom of the other up, a wooden rod being passed through the center of each, with a block of wood secured to top one and a small flag above that, enough broken stone in the bottom bucket to submerge all to the top of the block, only leaving the small flag out of the water.

Observations were taken on this float at intervals of five minutes by simultaneous angles from two transits.

The survey represented by accompanying tracing was made from a true meridian, the shore line being run along west side of the bay, offsets being made at intervals across the water.

The soundings were located by two transits where any dredging was to be done, and by one transit, with the sounding boat on a back range, where no work of improvement is contemplated. Angles locating sounding boat were taken every thirty seconds. All points on opposite side of bay were located by triangulation and calculated distances.

The soundings were reduced to the mean low-water plane at three different points: First, at North Island; second, at Estherville-Minim Creek Canal mouth in Winyah Bay; and third, at Georgetown. These mean low waters had previously been secured by recording all the low waters for a long time, including a number of lunar months, in getting their average.

The tonnage and value of commerce on Winyah Bay, as reported by Mr. W. D. Morgan, mayor of Georgetown, and forwarded with annual report for fiscal year ending June 30, 1903, are as follows: 387,471 tons, valued at \$9,310,682.

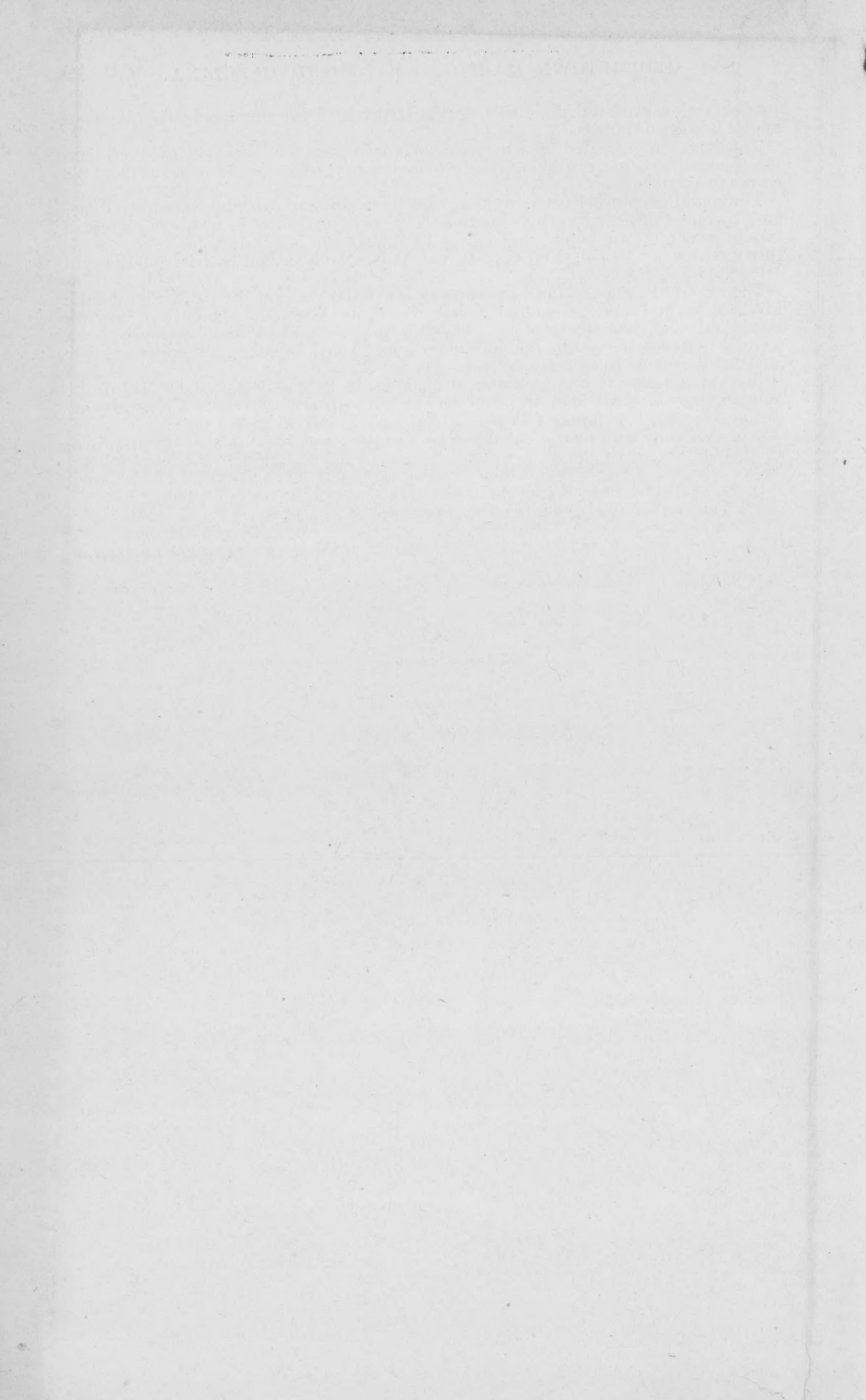
A further statement of the commerce of the port, and reasons why the improvement should be carried to 18-foot depth at mean low water, were made in full by Mayor Morgan, together with a committee of gentlemen from the Georgetown board of trade, to the Board of Engineers, which met at this office June 18, 1903.

Very respectfully, your obedient servant,

REID WHITFORD,
Assistant Engineer.

Capt. G. P. HOWELL,
Corps of Engineers, U. S. A.





IMPROVING WINYAW BAY. S.C. INCLUDING GEORGETOWN HARBOR.

FROM THE OCEAN ENTRANCE TO A POINT ABOUT
ONE MILE ABOVE CITY LIMITS OF GEORGETOWN

UNDER THE DIRECTION OF
Capt. J. C. Sanford, Corps of Engrs. U.S.A.
And Whitford, Chas. Engr.
Scale: 1"=2000'

NOTES:
Soundings in feet and tenths and refer to Mean Low Water.
Depth of 10 fathoms and under are shown on dotted surfaces.
6 ft Contour 12 ft Contour 14 ft Contour

Finally Completed
Under the direction of
Capt. G. P. Howell, Corps of Engrs. U.S.A.
August, 1903.

